IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **ONO, Yuji et al.**

Group Art Unit:**1746**

Serial No.: **09/940,788**

Examiner: **Joseph L. Perrin**

Filed: **August 29, 2001**

P.T.O. Confirmation No.: **4613**

For: **SINGLE WAFER TYPE SUBSTRATE CLEANING METHOD AND APPARATUS**

SUBMISSION OF REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, Va 22313-1450

February 2, 2004

Sir:

Submitted herewith are an original and two copies of a Reply Brief in the above-identified U.S. patent application.

In the event that any additional fees are due with respect to this paper, please charge Deposit Account No. 01-2340. This paper is filed in triplicate.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP

James E. Armstrong IV
Attorney for Applicants
Reg. No. 42,266

JAM/xl
Atty. Docket No. **011075**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930

23850
PATENT TRADEMARK OFFICE

Enclosures: Duplicate of this paper; Reply Brief and two copies

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AF/1746

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ATTENTION: Board of Patent Appeals and Interferences

APPELLANT'S REPLY BRIEF (37 CFR §1.193(b)(1))

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

February 2, 2004

Sir:

In response to the Examiner's Answer (Paper No. 13), mailed December 2, 2003, entry and consideration of this reply brief is respectfully requested.

A Notice of Appeal was filed on July 9, 2003

The Appeal Brief was filed on October 7, 2003

This reply brief is being timely transmitted in triplicate (37 CFR §1.192(a)).

REPLY BRIEF

VI. Issues

Issue: Whether claims 1-3 are anticipated under 35 U.S.C. §102(b) by Cady (U.S. Patent No. 4,544,445), as stated in paragraph no. 4 of the final Office action.

Appellants acknowledges that the Examiner withdrew the rejection of claims 1-3 as anticipated under 35 U.S.C. 102(b) by Bergman et al. (U.S. Patent No. 5,377,708), as stated in paragraph no. 6 of the Examiner's Answer.

VII. Grouping of Claims

The Examiner states that claims 1-3 stand or fall together "because Appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof."

Although Appellants did not recite the explicit wording "the claims do not stand or fall together," Appellants clearly indicated that the claims were grouped into two exclusive groups for purposes of appeal. Moreover, Appellants clearly presented reasons in support of this grouping in the Arguments section, where Groups I and II are argued under separate headings.

Therefore as indicated in VII. Grouping of the Claims in the Appeal Brief filed on October 7, 2003, for purposes of appeal, the claims are grouped as follows:

Group I: Claims 1 and 3

Group II: Claim 2.

This grouping of claims does not stand or fall together for the reasons argued on p. 6 and p. 9 of the Appeal Brief filed on October 7, 2003.

XI. Response to Examiner's Arguments

The Examiner refers to Appellants' discussion of the shapes of Cady's supply ports 32a at the bottom of page 7 of the Appeal Brief. In paragraph 3 on page 4, the Examiner states that:

> "The Examiner agrees that the argued structure is not claimed in the method of claim 1, and since limitations from the specification are not read into the claims Appellant's arguments **relying on subject matter not claimed** is not persuasive."

Appellants believe that the Examiner has misrepresented their position. Appellants are **not** "relying on subject matter not claimed." It is clear that the prior art **does not explicitly teach the claimed method limitations**. The question at issue is whether the claimed method limitations are **inherent** in the prior art. Appellants are making a comparison of their apparatus, which **can** achieve the claim limitations, with the apparatus of the prior art, in order to make a **technical argument** that the prior art apparatus **does not** achieve these limitations. That is, Appellants' specification is being used as a source of technical data. This use of Appellants specification as a source of technical data is completely proper, since the specification is filed under declaration.

On page 4, paragraph 4, the Examiner specifically refers to Figures 8A and 8B of Cady, stating that these:

> "are very similar in structure to those of Appellant. Each provides gas supply ports such that the surface area of the supply ports is greater at the outer periphery of the showerhead than at the center thereof."

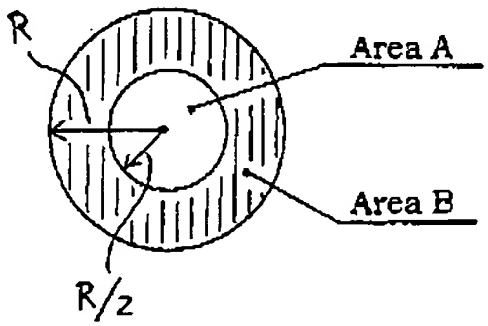
The Examiner goes on to discuss the ports in Figure 8B, noting "three ports (64', 64" and 64"') at the outer periphery and one port (64"") at the center." The Examiner infers that this implies a 3:1 ratio of gas volume at the periphery to at the center.

Again, Appellants' understanding is that the Examiner's technical analysis of the flow implied by Cady's Fig. 8B is incorrect, since there is much more disk area away from the center where ports 64', 64" and 64"' supply the gas, than at the center.

The Examiner states that a structural difference between claimed invention and Cady is slight. However, Cady can not completely prevent from dragging air from outside of the wafer into outer periphery thereof. It seems a basic object for Cady's structure to supply N_2 gas uniformly to the wafer surface.

Fig.1 below shows a case that a wafer surface is divided into two areas (A and B) at a half point of the radius. Area A and Area B are in the ratio of 1:3 by a simple calculation. This result agrees with "three ports at the outer periphery and one port at the center" in Cady's Fig. 8 and further agrees with the Examiner's inference of a 3:1 ratio of gas volume at the periphery to at the center. This supports well Appellants' view that Cady's structure is to supply N_2 gas uniformly to the wafer surface.

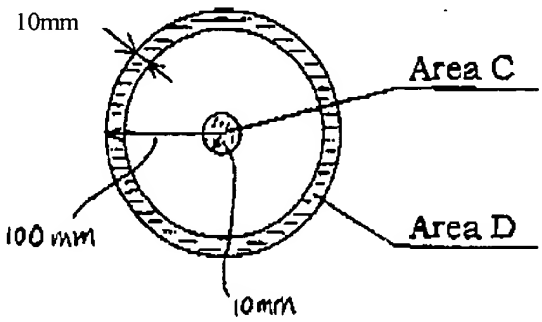
Fig. 1



On the other hand, the object of claimed invention is to supply larger amount of N_2 gas at the outer periphery of wafer than at the center thereof, not to supply uniformly on the wafer surface.

Fig. 2 below is for an explanation in a case that N_2 gas reaches the outer periphery of wafer.

Fig. 2



In Fig. 2, Area C = 100 π mm^2 and Area D = 1900 π mm^2. Area C and Area D re in the ratio of 1:19. That is to say, in case of supplying N_2 gas uniformly on the wafer surface, the density of N_2 gas at the outer periphery decreases to that of 1/19 of the center and this can not perfectly prevent air from dragging from outside of the wafer into outer periphery thereof.

Thus the claimed invention can prevent air dragging by supplying a large amount of N_2 gas to the outer periphery of wafer. Accordingly, claimed invention is clearly distinguished form Cady.

On page 5, paragraph 2, of the Examiner's answer, the Examiner further addresses Appellants' arguments from page 8, second paragraph, of the Appeal Brief. The Examiner essentially agrees with Appellants' point regarding the ambiguous wording "fluid flow" in column 9, lines 15-24, of Cady, but then refers to column 3, lines 38-49, and Figures 8A-8B stating that this:

> "clearly show[s] fluid flow guides such that the flow of fluids, such as nitrogen drying gas, direct the supply more towards the outer periphery than to the center." (emphasis in original)

However, Appellants note that Cady in column 3, lines 38-49, **does not use the term "fluid flow"** and does not, in fact, clarify the meaning of that term. The point at issue was the meaning of the term "fluid flow" in column 9, lines 15-24, and thus these lines in Cady appear to refer only to the washing liquid.

At the bottom of page 5 of the Examiner's answer, the Examiner addresses Appellants remarks that none of Cady's Figures 6-8(b) appears to resemble Figures 4(A) to 4(C) of the present application. The Examiner again argues that the structures in Figures 4(A) to 4(C) are note claimed. Again, Appellants note that their argument comparing Cady's structure to that of Appellants' apparatus was a legitimate argument for addressing the inherency rejection, which argues at least that the method inherent in Cady's apparatus is not identical to the claimed method, and that inherency cannot be asserted based on similarity of the prior art apparatus to the apparatus of the present application. Appellants did not state that this argument in itself proved the lack of inherency in the prior art.

On page 6, first paragraph, the Examiner further states that "the slight structural variants associated with the showerhead of Cady and Appellant's showerhead are not claimed." The meaning of this is unclear, but the Examiner appears to be inferring that Cady's apparatus is only a "slight structural variant" of the apparatus of the claimed invention. This is in fact incorrect.

Appellants thank the Examiner for being willing to consider the declaration. Since the Examiner has considered the declaration, Appellants respond to his arguments.

First of all, the Examiner states:

> "Appellant relies on **hearsay** without experimental evidence in arguing how the gas may flow solely at the edge of the wafer." (emphasis added)

Appellants assert that this is an improper assessment. The Examiner is correct that the declaration does not provide any actual data on Cady's apparatus. However, the Declaration is not "hearsay", but a completely appropriate technical analysis of the prior art.

Appellants note that the inherency rejection being used by the Examiner is also not based on any data on Cady's apparatus. Rather, the rejection is based on a technical analysis by the Examiner of what would be inherent in Cady's method. To supplement Appellants' arguments addressing what is plainly apparent in the text and figures in the Cady reference, Appellants therefore presented a gas flow analysis declaration by a technical expert.

The Examiner then states:

> "Secondly, Appellant is silent with respect to the claimed subject matter, namely, the inert gas supplied to the center of the wafer, much less whether or not Cady anticipates the amount of inert gas supplied at the outer peripheral portion as being larger than the amount of gas at the center thereof."

Appellants assert that this is an incorrect assessment of the Declaration. On page 1, second paragraph from the bottom, of the Declaration, Mr. Edo clearly summarizes this aspect of the invention and makes it clear that the Declaration addresses this issue. In the second to last paragraph on page 2 of the Declaration, Mr. Edo summarizes this remarks by stating that "Cady's apparatus

does not appear to be able to obtain the gas flow limitations of claim 1." Whether or not the Examiner agrees with the analysis, the Declaration has clearly addressed the key issue.

Appellants therefore request that the Declaration be considered on its merits as a technical analysis by a technical expert.

At the top of page 7, the Examiner turns to Appellants argument on page 9 regarding claim group II (claim 2), that Cady does not disclose a sealed drying space at the outer periphery, in particular commenting on the Examiner's incorrect citations of arrows 40 as illustrating the sealed drying space. The Examiner now states that:

> "This is not persuasive because the Examiner cited column 7, lines 44-58, which taken in its entirety includes the gas flow 40, stated in column 7, lines 44-47, as the space which includes the sealed system, stated in column 7 line 54. The gas flow space which flows at the outer peripheral portion of the face of the wafer is in a sealed system, as claimed by applicant."

In response, Appellants note that their remarks were appropriate, since the Examiner clearly indicated "sealed drying space 40" was the element in Cady corresponding to the sealed drying space in the claims. Appellants note that 37CFR 1.104 (c)(2) states, in part:

> "When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable."

However, the Examiner has now clarified his rejection, and the Appellants have the following remarks:

The Examiner now refers to column 7, lines 44-47, which read:

> "Regardless of which of the elements, either wafer 14 or guide 12, is rotated, the fluid flow is indicated by arrows 40 so that the fluid, be it liquid or gas, moves outwardly via centrifugal force and then downwardly as indicated into a chamber 42 which has a drain 44 associated therewith."

The Examiner also refers to column 7, line 54. Lines 53-58 read:

> "The chemicals are contamination free, and the system is sealed such that the fluid path **from the reservoirs out through gap 30** is sealed to the extent that the flow path always contains **fluid, thereby removing any entrained and undesirable gases** or contaminants which are removed at drain 44." (emphasis added)

However, Appellants note several points about the Examiner's review of the prior art:

1) The reference to "the system is sealed" refers to the fluid path "from the reservoirs out through gap 30". As can be seen in Cady's Fig. 1, this refers to the fluid flow only before contacting the wafer through when the fluid reaches the edge of the wafer. Once it leaves the edge of the wafer, it **is no longer within "gap 30"**. However, claim 2 refers to a sealed drying space at the outer peripheral portion of the edge of the wafer. Therefore, these lines of Cady do not disclose this limitation of claim 2. Moreover, it is apparent from Fig. 1 of Cady that Cady's apparatus does not have a sealed drying space at the outer peripheral portion of the edge of the wafer.

2) It is apparent lines 53-58 refer to flow of "fluid" which is **liquid**, not gas. This can be clearly inferred from the disclosure that the "flow path always contains **fluid, thereby removing any entrained and undesirable gases**" (emphasis added). That is, "fluid" means **liquid**, and this liquid may contain undesirable gas. As discussed previously, the present claims are method claims reciting a flow of **inert gas**. Disclosure of a flow of **liquid**, which is not an inert gas, cannot teach or

suggest the recitation of the present claims.

Accordingly, it has been deemed that the rejection of claims 1-3 is in error and should not be sustained.

In the event this paper is not timely filed, appellant hereby petitions for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 01-2340, along with any other additional fees which may be required with respect to this paper.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP

James E. Armstrong IV
Attorney for Applicant
Reg. No. 42,266

JAM/xl
Atty. Docket No. **011075**
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930

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PATENT TRADEMARK OFFICE

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